**Objective**

Environmental factors are involved in the aetiology of type 1 diabetes. A particular role for infectious exposures has been postulated. Temporal and spatial variation in incidence would be consistent with this hypothesis. We aimed to test predictions of increasing incidence and spatial variation occurring among cases of type 1 diabetes in children (aged 0–14 years) that might arise as a result of environmental mechanisms.

**Design**

Population-based descriptive analysis of type 1 diabetes data.

**Setting**

Northeast England.

**Participants**

The study analysed 545 cases of type 1 diabetes diagnosed in children who were resident in a geographically defined region of northeast England during the period 1990–2007.

**Main Outcome Measures**

Age-specific and age-standardised incidence rates were calculated. Temporal trends were analysed using Poisson regression. Relationships between incidence rates and small area (census ward) population density and Townsend deprivation index (and its components) were analysed using negative binomial regression.

**Results**

Age-standardised incidence rates increased from 15.7 per 100,000 population in 1990–1995 to 27.9 per 100,000 population in 2002–2007. Furthermore, there was a regular 6-year cyclical pattern of plus or minus 25% in incidence rates (RR 1.25; 95% CI 1.11 to 1.41) and an overall increase of 4.8% per annum (95% CI 3.1 to 6.6). Lower incidence was associated with residence in wards that had higher levels of unemployment (RR per one percent increase in unemployment 0.97; 96% CI 0.95 to 0.99).

**Conclusions**

The results are consistent with the involvement of one or more environmental exposures in aetiology. A possible role for infectious exposures is postulated. Temporal and spatial variation in incidence would be consistent with this hypothesis. We aimed to test predictions of increasing incidence and spatial variation occurring among cases of type 1 diabetes in children (aged 0–14 years) that might arise as a result of environmental mechanisms.